APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/553,735	04/20/2000	Kishan Shenoi	9548-770	5543

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 April 2000</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-43</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-43</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claim 42 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing

to particularly point out and distinctly claim the subject matter which applicant regards as the

invention.

3.   Claim 42 recites the limitation "the correlater circuit" in line 2. There is insufficient

antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1-13, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et

al U.S. Patent No 6,067,292 in view of Kaku U.S. Patent No 6,104,748.

As per claim 1, Huang et al discloses a method for tracking CDMA pilot channel signal to

discipline an oscillator comprising: down converting (see fig.2 elements 202 and 203 and col.4,

lines 16-20) an RF signal from a center frequency Fr to an intermediate center frequency Fl where

fl is greater than or equal to a CDMA chip rate Fc wherein down converting includes

incorporated bandpass filtering (see fig.2 elements 204, 205 and col.4, lines 20-22) to remove

extraneous signals while passing said CDMA pilot channel signal (see abstract and col.2, lines 1-

4); converting a signal format from analog to digital using a single analog to digital converter (see

fig.3 elements 301, 302 and col.4, lines 55-57) employing a sampling rate of Fs to create a signal

sampling signal Sn; employing correlation circuit (see figs.4, 5 elements 402-404, 520 and col.5,

lines 20-35 and col.6, lines 30-67) to establish a correlation between the Sn locally generated

versions of I-channel and Q channel PN signals respectively; generating an estimating of an error

(see col.17, lines 16-25).

However Huang et al does not teach generating an estimating of a frequency error of the

oscillator using correlation values corresponding to (2M + 1) time shifts where a time shift of K

corresponds to a time shift that provides the maximum correlation value and M is greater or equal

to 1.

Kaku teaches generating an estimating of a frequency error of the oscillator using

correlation values corresponding to (2M + 1) time shifts where a time shift of K corresponds to a

time shift that provides the maximum correlation value and M is greater or equal to 1 (see figs. 3,

6-11 element 4 and col.7, lines 55-58 and col.6, lines 39-42 and col.9, lines 28-67 and col.10,

lines 1-15).

It would have been obvious to one of ordinary skill in the art to implement the teaching of

Kaku into Huang as to performed frequency synchronization for the clock signal used in the

receiving apparatus such that the despreading correlation result of the received signal using PN

code sequence in the receiving apparatus always has a maximum as taught by Kaku (see col.10,

lines 8-15).

As per claims 2-4, the method of Huang does includes a sampling rate, Fs, an intermediate

center frequency, fl, and a chip rate, fc. Furthermore implementing the Fs, fl, and fc to be related

by Fs=4fc and Fl=fc+ kFs would have been obvious to one skill in the art in order to accurately

remove noise in the pilot channel signal.

As per claim 5, the method of Huang does includes a single accumulator for generating

both real and imaginary (see fig.5 element 504 and col.6, line 52).

As per claim 6, it would have been to one skill in the art to implement the monitoring of

both positive overflows and negative overflows into Huang in order to enhance the correlation

capability of the channel.

As per claim 7, the method of Huang does include correlation process instead of

matched filter (see fig.4 element 402).

As per claim 8, the method of Huang does include a receiver (see fig.2).

As per claims 9-10 and 13, it would have been to one skill in the art to implement the

correlation computation of time shift lags into Huang in order to achieve better correlation in the

channel.

As per claims 11-12, the method of Huang does include background correlation (see fig.4

element 403).

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United
States before the invention thereof by the applicant for patent, or on an international application by another who
has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention
thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act

of 1999 (AIPA) do not apply to the examination of this application as the application being

examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35

U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the

amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7.   Claims 14-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al

U.S. Patent 6,067,292.

As per claim 14, Huang et al discloses an apparatus to track a pilot signal, comprising: a

correlator circuit adapted to compute a complex correlation between a received version of the

pilot signal and locally generated versions of I-channel and Q-channel PN signals, respectively

(see figs.4, 5 elements 402, 520 and col.2, lines 5-10 and col.5, lines 10-67 and col.6, lines 30-67).

As per claim 15, the apparatus of Huang does includes a buffer. Note that a FPGA is known in the art as buffering device or a storage device. Therefore the buffer of Huang is considered as a FPGA.

As per claim 16, the method of Huang does includes a single accumulator for generating both real and imaginary (see fig.5 element 504 and col.6, line 52).

As per claims 17-18, the method of Huang does includes a signal processor having a DSP (see fig.2 element 209 and col.4, line 25).

As per claim 19, the method of Huang does includes a signal processor for averaging correlations values (see col.4, lines 26-28).

As per claim 20, the method of Huang does includes parallel correlator (see fig.4 element 402-404).

As per claim 21, the method of Huang does includes a background correlation (see fig.4 element 404).

As per claim 22, the method of Huang does includes a CDMA pilot (see abstract and col.4, line 28).

Claim Rejections - 35 USC § 102

8.　　The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United
> States before the invention thereof by the applicant for patent, or on an international application by another who
> has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention
> thereof by the applicant for patent.

　　　　The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act

of 1999 (AIPA) do not apply to the examination of this application as the application being

examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35

U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the

amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9.　　　Claims 24-25, 27-28, 32-43 are rejected under 35 U.S.C. 102(e) as being anticipated by

Feher U.S. Patent No 6,479,055 B1.

　　　　As per claims 24 and 34, Feher et al discloses a method for tracking a pilot channel

comprising: disciplining an oscillator (see figs.6b , 33 elements 6.22, 33.6 and col.20, lines 6- 18)

including generating a spectrum shaped channel pilot signal (see col.1, line 16 and col.13, line

61)Y(n) from a chip-rate PN sequence by: over sampling (see figs.6b , 33 elements 6.23, 6.25

33.7 and col.20, line 7 and col.37, line 7). Note that element 6.23 is known in the art as to

perform over sampling of RF signal or finding a degree of similarity the correlation between two

incoming signals therefore element 6.23 is considered as the claimed over sampling or correlating)

the chip rate PN sequence at a higher sampling rate to yield a signal A(n); passing A(n) through a

first FIR filter (see figs. 6b, 33 elements 6.26 or 6.27 or 33.8 and col.19, lines 20-24 and col.20,

lines 11-17) whose impulse response coefficients are G(n) to yield a signal B(n); filtering B(n)

with a second filter (see figs.6b, 33 elements 6.30 or 6.31 or 33.9 and col.19, lines 20-24 and

col.20, lines 11-17) to yield the spectrum shaped channel pilot Y(n).

As per claim 25, the method of Feher does include an I channel pilot (see fig.33 element).

As per claim 27, the method of Feher does include I channel down to zero (see col.24,

lines 55-56).

As per claim 28, the method of Feher does include baseband signal (see abstract).

As per claim 32, the method of Feher does include a receiver (see fig.6b).

As per claim 33, the method of Feher does include an I channel pilot (see fig.33 element).

As per claim 35, the method of Feher does include a FPGA (see col.16, line 55).

As per claims 36-37, the method of Feher does include a signal processor having a DSP

(see col.16, line 55).

As per claim 38, the method of Feher does include an A/D converter (see fig.30 element

30.10).

As per claim 39, the method of Feher does include a 4-point FIR filter (see fig.13C and

col.19, lines 21-22 and col.27, lines 30-31).

As per claim 40, the method of Feher does include a 4-point FIR filter therefore a 48 point FIR filter is inherently included in Feher.

As per claim 41, the method of Feher does include a CDMA channel (see col.1, line 15).

As per claim 42, the method of Feher does include a background correlator (see element 6.23). Note that element 6.23 is known in the art as to perform over sampling of RF signal or finding a degree of similarity the correlation between two incoming signals therefore element 6.23 is considered as the claimed correlator).

As per claim 43, the method of Feher does include a receiver (see fig.6b).

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11.   Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feher U.S. Patent No 6,470,055 B1 in view of Kaku U.S. Patent No 6,104,748.

As per claim 29, Feher discloses all the features of the claimed invention except a sampling clock is derived from a VXCO that is a phase locked to a reference frequency.

Kaku teaches a sampling clock is derived from a VXCO that is a phase locked to a

reference frequency (see figs.3, 12 element 9 and col.3, lines 35-40 and col.5, lines 10-17 and

col.6, lines 14-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of

Kaku into Feher so that a spreading code generator tracks the spreading code sequence of the

received multiplied in the transmitting apparatus such that synchronization with the spreading

code sequence is established as taught by Kaku (see col.2, lines 53-56).

As per claim 30, it would have been to one skill in the art to implement a correlation

computation lags into Feher in order to achieve better correlation in the channel.

As per claim 31, it would have been obvious to one of ordinary skill in the art to

implement the a correlation process instead of a matched filter into Feher so that better

synchronization could be achieved.

12.   Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feher U.S. Patent

No 6,470,055 B1 in view of Zhodzishsky et al U.S. Patent No 6,493,378 B1.

As per claim 26, Feher discloses all the features of the claimed invention except

monitoring of both positive overflows and negative overflows.

Zhodzishsky et al teaches monitoring of both positive overflows and negative overflows

(see col.14, lines 30-41).

It would have been obvious to one of ordinary skill in the art to implement the monitoring

of both positive overflows and negative overflows of Zhodzishsky et al into Feher as measure the

different offset values as taught by Zhodzishsky et al (see col.14, lines 30-41).

Conclusion

13.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Krasner U.S. Patent No 6,289,041 teaches a Fast acquisition.

Woo U.S. Patent No 5,808,582 teaches a Global positioning system.

Harrison et al U.S. Patent No 6,151,353 teaches a pre-acquisition frequency offset.

Molnar U.S. Patent No 6,298,227 B1 teaches a method and apparatus for frequency conversion.

        Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Emmanuel Bayard whose telephone number is (703) 308-9573. The

examiner can normally be reached on Monday-Thursday from 8:00 AM - 5:30 PM. The examiner

can also be reached on alternate Fridays.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chi Pham, can be reached on (703) 305-4378. The fax phone number for this Group

is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Group receptionist whose telephone number is (703) 305-3800.
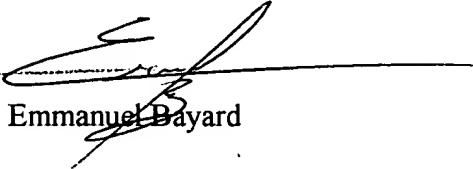
Emmanuel Bayard

Patent Examiner

May 16, 2003